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SITE: Medley Farm
BREAK: 8/6
OTHER: 02

Second Five-Year Review Report

For The
Medley Farm Drum Dump Superfund Site
Gaffney, Cherokee County, South Carolina

September 2004

PREPARED BY:
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PREPARED FOR:
Region 4
U.S. Environmental Protection Agency

Approved by: for J. Scott Gilbert
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U.S. EPA, Region 4

Date: 9/30/04

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List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (1980), as amended
DP	Dual Phase
EPA	United States Environmental Protection Agency
EW	Extraction Well
ESD	Explanation of Significant Difference
MCL	Maximum Contaminant Level
MW	Monitoring Well
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PPB	Parts Per Billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SCDHEC	South Carolina Department of Health and Environmental Control
VOC	Volatile Organic Compound

Executive Summary

The Medley Farm Site is a 7-acre section of a 61.9 acre parcel of rural land located on Burnt Gin Road about six miles south of Gaffney, South Carolina in Cherokee County. The approximate center of the site is located at latitude 34°58'54" North and longitude 81°40'02" West. Land use in the Site vicinity is primarily agricultural and light residential.

Prior to the mid 1970's, the property was maintained as woods and pasture land. From approximately 1973 to 1976, several area textile, paint, and chemical manufacturing firms paid to dispose of their industrial wastes on the Medley property. The Site was first documented in 1981 when a firm disposing of wastes at the Site complied with the disposal notification requirements of CERCLA, reporting its use of the Medley Farm Site to EPA.

EPA initiated a removal action on June 20, 1983. A total of 5,383 55-gallon drums and 15-gallon containers were removed from the Site. Empty drums were crushed and taken to a sanitary landfill. 24,000 gallons of liquids from the drummed waste were taken off-site by tanker and incinerated. 2,132 cubic yards of solid waste and contaminated soils were taken to an approved hazardous waste landfill. About 70,000 gallons of water were drained from six small lagoons.

A Remedial Investigation (RI) determined that the soil was contaminated with Volatile Organic Compounds (VOCs) in three primary areas. It also determined that the groundwater was contaminated with VOCs. Four of the primary contaminants of concern include 1,1-dichloroethene (1,1-DCE), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), and tetrachloroethene (PCE).

EPA issued a Record of Decision (ROD) On May 29, 1991, which selected extraction and on-site treatment of contaminated groundwater via air stripping. Treated water would be discharged to Jones Creek via a National Pollution Discharge Elimination System (NPDES) permit. Continuous analytical monitoring of groundwater and surface water would be performed. Soil Vapor Extraction (SVE), a technique that applies a vacuum on air extraction wells to remove contaminants, was selected to remove pollutants from the soil. The goals of the selected remedy were to eliminate the principal threat posed to human health and the environment, prevent further migration of contaminants from the soil to the groundwater, and remediate the groundwater to drinking water standards.

In September 1993, EPA approved the remedial design for cleanup of the Medley Farm Site. During 1993-94 an 11-well pump-and-treat system for groundwater was constructed, which employs a central air stripping unit. A low-profile air-stripping unit removes volatile organic compounds (VOCs) from groundwater. After treatment, the water is discharged to Jones Creek under an NPDES permit. The remedy also included an SVE system of 8 vapor extraction wells piped to a central vacuum apparatus, to remove VOCs from three main areas of soil contamination. To enhance the recovery of soil vapors from the subsurface, an additional eight

wells, which were originally installed as soil vapor monitoring wells, were connected to the vacuum extraction system in 1998. In 1999, the soil cleanup targets for two of the three soil areas were shown to have been achieved, and SVE operations were terminated in those areas. In 2000, an additional SVE well and three dual phase (DP) wells (a combination SVE and groundwater recovery well) were installed to further enhance removal of VOCs from the subsurface soils. The soil remediation system now consists of nine SVE wells, three DP recovery wells, eight vapor monitoring wells, and a central vacuum unit.

Treatment system laboratory results indicate that both the SVE and groundwater treatment systems are functioning as designed, and that the groundwater system effluent is meeting the levels established in the NPDES permit. The monitoring wells located on the Site are sampled regularly, which will continue until all the remedial goals for all contaminants are met. Although several contaminants are still present above their ROD goals, the concentrations of VOCs in the groundwater at the Site have continued to decline.

Since start-up of the groundwater recovery system, over 100 million gallons of VOC-affected groundwater have been recovered and treated. Over 243 pounds of VOCs have been removed from the aquifer, and over 2,234 pounds of VOCs have been recovered from the vadose zone using the SVE treatment system.

Recent evaluation of the Site remediation progress suggests that the existing remediation systems may be approaching asymptotic conditions in their ability to remove target VOCs from the subsurface. Consequently, as a system optimization initiative, a work plan and design report was submitted by the PRPs in April 2004 to implement a supplemental remedial action, enhanced reductive dechlorination, at the Site. Reductive dechlorination is expected to enhance treatment performance and accelerate remedy completion. This work plan is currently under review by EPA and SCDHEC.

The main issue requiring follow-up is the implementation of the supplemental remedial action (enhanced reductive dechlorination) as described above. In addition, several minor deficiencies noted in the Site Inspection represent follow-up items. However, among those items, only one (a valve handle replacement) could potentially affect remedy protectiveness.

All immediate threats at the Site have been addressed. The long-term remedy at the Medley Farm Site, as prescribed in the ROD for soils and groundwater, is still in progress. The extent and degree of groundwater and soil contamination has been decreasing since the remedial action began. The remedy at the Medley Farm Site is expected to be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name: Medley Farm Drum Dump		
EPA ID: SCD 980 558 142		
Region: 4	**State:** SC	**City/County:** Gaffney / Cherokee County

SITE STATUS	
NPL status: X Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction X Operating ☐ Complete	
Multiple OUs? ☐ YES X NO	**Construction completion date:** 03 / 30 / 1995
Has site been put into reuse? ☐ YES X NO	

REVIEW STATUS	
Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Keisha D. Long	
Author title: Project Manager	**Author affiliation:** SCDHEC
Review period: 05 / 27 / 2004 to 07 / 21/ 2004	
Date(s) of site inspection: 05 / 27 / 2004	
Type of review: ☐ Post-SARA ☐ Pre-SARA ☐ Non-NPL Remedial Action Site ☐ Regional Discretion	☐ NPL-Removal only ☐ NPL State/Tribe-Lead X Statutory Review
Review number: ☐ 1 (first) X 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA On-site Construction at OU # ☐ Construction Completion ☐ Other (specify)	☐ Actual RA Start at OU# X Previous Five-Year Review Report
Triggering action date: 07 / 21 / 1999	
Due date: 07 / 21 / 2004	

Five-Year Review Summary Form cont'd.

Issues:

Recent evaluation of the Site remediation progress suggests that the existing remediation systems may be approaching asymptotic conditions in their ability to remove target VOCs from the subsurface. Consequently, as a system optimization initiative, a work plan and design report was submitted by the PRPs in April 2004 to implement a supplemental remedial action, enhanced reductive dechlorination, at the Site. Reductive dechlorination is expected to enhance treatment performance and accelerate remedy completion. This work plan is currently under review by EPA and SCDHEC.

During the Site Inspection, several deficiencies were noted including unlabeled drums, several wells that were not labeled, a cracked valve handle at the treatment plant, an inaccurate map scale (certain wells could not be found), and concerns about the effects of logging near an onsite creekbed. However, among those items, only the valve handle replacement could potentially affect remedy protectiveness.

Recommendations and Follow-up Actions:

The main issue requiring follow-up is the implementation of the supplemental remedial action (enhanced reductive dechlorination) as described above. In addition, several minor deficiencies noted in the Site Inspection represent follow-up items.

Protectiveness Statement(s):

The remedy at the Medley Farm Site is expected to be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

Section 1. Introduction

The purpose of a Five-Year Review is to determine whether the remedy at a Site is protective of human health and the environment. The methods, findings, and conclusions of the evaluation are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to further evaluate and address them as necessary.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPA Region 4 in conjunction with SCDHEC conducted the Five-Year Review of the remedy implemented at the Medley Farm Superfund Site in Gaffney, South Carolina. This review was conducted for the Site from May 2004 to July 2004. This report documents the results of the review.

This is the second Five-Year Review for the Medley Farm Site. The triggering action for this statutory review is the completion and signing of the first Five-Year Review on July 21, 1999. The Five-Year Review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

Section 2. Site Chronology

Table 1 - Chronology of Site Events

Event	Date
Disposal of waste materials	1973-1976
SCDHEC observes approximately 2,000 55-gallon drums on-site	5/3/1983
SCDHEC collects soil samples for analysis	5/19/1983
EPA visits the Site and collects additional samples for analysis	5/30/1983
An immediate removal action is initiated by EPA	6/20/1983
The removal action is completed	7/21/1983
The United States files a complaint in a cost recovery action against the owner of the Site and various waste generators	6/1986
Preliminary Assessment performed	4/29/1987
The PRPs enter into an Administrative Order on Consent to perform the RI/FS	1/29/1988
The Medley Farm Site is placed on the NPL	3/14/1990
EPA issues a Record of Decision	5/29/1991
EPA approves the remedial design for cleanup of the Medley Farm Site	9/1993
Explanation of Significant Differences is issued	12/10/1993
Onsite construction of the SVE and groundwater remediation systems begin	6/3/1994
Final inspection of the groundwater and SVE systems (Construction Completion)	3/30/1995
To enhance the recovery of soil vapors from the subsurface, an additional 8 wells, are connected to the vacuum extraction system	1998
First Five Year Review is completed	07/21/1999
NPDES permit is renewed	11/20/2002
Work plan and design report for reductive dechlorination is submitted by the PRP	4/2004

Section 3. Background

The Medley Farm Site (the Site) occupies approximately seven acres of a 61.9-acre tract of land. The Site is located on Burnt Gin Road, about six miles south of the City of Gaffney (see Attachment A). Land use in the Site vicinity is primarily agricultural and light residential.

A. Physical Characteristics

Residual soil at the Site is absent or occurs as a thin layer overlying the saprolite. This soil layer ranges in thickness from zero to 11 feet and typically consists of clayey silt with varying amounts of fine sand, clay, mica flakes, and quartz gravel.

The saprolite is relatively thick across the Site, ranging from 50 to 70 feet thick near the former disposal areas to 7 to 28 feet along Jones Creek at the eastern boundary of the property. The saprolite consists predominantly of silt with varying amounts of fine to coarse sand and clays. Underlying the saprolite is bedrock that consists primarily of gneiss.

Groundwater at the Site occurs in the saprolite, in the zone of highly fractured and weathered bedrock zone (identified as the transition zone), and in moderately fractured bedrock underlying the Site. A controlling factor on the direction of VOC migration in the subsurface is a fault located southeast and downgradient of the recovery wells. The fault strikes N50E and dips 70 degrees to the southeast. The fault is a major reason for the elongation of the impacted groundwater plume to the northeast of the former disposal areas (see Attachment B). Depth to groundwater at the Site is 56 to 68 feet in the disposal area, decreasing to six to eight feet adjacent to Jones Creek. The saprolite, transition zone, and shallow bedrock are hydraulically interconnected; therefore, these three units are considered a single aquifer.

All groundwater in South Carolina is classified as Class GB Waters (South Carolina Regulation 61-68). This classification means that all groundwater potentially meeting the definition of underground sources of drinking water must meet the quality standards set forth in the State Primary Drinking Water Regulations (R.61-58.5).

B. History of Contamination and Response Action

From approximately 1973 to 1976, several area textile, paint, and chemical manufacturing firms paid to dispose of their industrial wastes on the Medley property. The Site was first documented in 1981 when a firm disposing of wastes at the Site complied with the disposal notification requirements of CERCLA, reporting its use of the Medley Farm Site to EPA.

In May 1983, in response to a local citizen who witnessed the disposal of barrels on the Medley property, SCDHEC took samples at the Site. SCDHEC notified EPA of the presence of half-

buried drums, many of which were leaking. That same month, EPA also investigated and sampled wastes, soil, and water at the Site.

EPA performed an emergency removal operation in June and July 1983. During this operation, EPA removed a total of 5,383 fifty-five-gallon drums and fifteen-gallon pails of waste, 2,132 cubic yards of refuse and contaminated soil, and 70,000 gallons of water and sludge from six small waste lagoons on the Site. The lagoon areas were then backfilled and graded. Testing of the solid and liquid waste materials removed from the property indicated that the primary chemicals of concern were volatile organic compounds (VOCs). The Medley Farm Site was proposed for addition to the National Priority List (NPL) in June 1986. The Site was placed on the NPL in March 1990.

SCDHEC and EPA conducted several investigative studies on the Medley property from 1983 to 1984. These studies included the sampling of private wells in the Site vicinity, a geological study, more extensive groundwater sampling, and a preliminary investigation of Site hydrogeology. During this same period, EPA compliance staff also initiated investigations to identify individuals and firms responsible for the waste disposal activities. Over the following two and a half years, EPA negotiated with several of the potentially responsible parties (PRPs) to investigate contamination at the Site.

In January 1988, five PRPs signed an Administrative Order on Consent (AOC) with EPA, where they agreed to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the Medley Farm Site. The PRPs hired Sirrine Environmental Consultants to develop the RI/FS work plans and to perform the work outlined in these plans. The RI/FS began in late 1988 and was completed in early 1991. The RI/FS findings determined that the soil was contaminated with VOCs in three primary areas. It was also determined that the groundwater was contaminated with VOCs. There are four primary contaminants of concern: 1,1-dichloroethene (1,1-DCE), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), and tetrachloroethene (PCE).

Section 4. Remedial Actions

As a result of the RI/FS results and a Baseline Risk Assessment, EPA determined that remediation of surface soil and groundwater would be required for the protection of human health and the environment. The selected remedy established clean-up for contaminants in the groundwater based upon drinking water standards and for the soil based on preventing leaching of contaminants to groundwater from the soils. The goals of the selected remedy were to eliminate the principal threat posed to human health and the environment, prevent further migration of contaminants to the groundwater, and remediate the groundwater to drinking water standards.

A. Remedy Selection

On May 29, 1991, EPA issued a Record of Decision (ROD) that selected the following remedy:

GROUNDWATER – PUMP AND TREAT

- Extraction of contaminated groundwater;
- On-site treatment of extracted groundwater via air stripping, with the need for controlling air stripper emissions to be evaluated in the remedial design;
- Off-site discharge of treated groundwater to Jones Creek via a National Pollution Discharge Elimination System (NPDES) permit; and
- Continued analytical monitoring of groundwater and surface water.

SOIL - SOIL VAPOR EXTRACTION (SVE)

- Installation of a network of air extraction wells in the unsaturated zone;
- Construction of a pump and manifold system that applies a vacuum on the air extraction wells to remove the contaminants from the soil; and
- Use of an in-line vapor-phase carbon absorption system to trap and absorb the soil vapor, prior to its release to the atmosphere.

The remedy was modified in October 1993 by an Explanation of Significant Difference (ESD) issued by EPA Region IV. The ESD removed the requirement to treat SVE system emissions prior to discharge. This decision was based on air dispersion modeling. Modeling of groundwater system air emissions also indicated that anticipated emission levels were well below those which could require a permit. Monitoring during both systems' startup operations supported and validated the modeling and the decision to issue the ESD.

B. Remedy Implementation

In September 1993, EPA approved the remedial design for cleanup of the Medley Farm Site. The design included 11 extraction (pumping) wells and associated pipelines which direct the extracted groundwater to a central air stripping unit. A low-profile air-stripping unit removes the VOCs from groundwater. After treatment, the water is discharged to Jones Creek under NPDES Permit No. S00046469. The design also included an SVE system of 8 vapor extraction wells piped to a central vacuum apparatus, to remove VOCs from three main areas of soil contamination.

Onsite construction of the SVE and groundwater remediation systems began on June 3, 1994. The majority of the construction work was completed by early December 1994. During the period December 1994 - early February 1995, punch list items from the Pre-final (December 9, 1994) and Final (January 19, 1995) inspections were corrected, and both systems were started.

VOCs present in the vadose-zone soils were initially removed through a series of eight SVE wells. To enhance the recovery of soil vapors from the subsurface, an additional eight wells, which were originally installed as soil vapor monitoring wells, were connected to the vacuum extraction system in 1998. In 1999, Performance Standards Verification Plan (PSVP) borings showed the soil cleanup targets in Areas 1 and 2 had been achieved. Consequently, SVE operations were terminated in these areas in June 2000. In October 2000, an additional SVE well (installed in area 3) and three dual phase (DP) wells (a combination SVE and groundwater recovery well) were installed to further enhance removal of VOCs from the subsurface. The soil remediation system now consists of nine SVE wells, three DP recovery wells, eight vapor monitoring wells, and a central vacuum unit (see Attachment C).

C. Operation & Maintenance

Treatment system laboratory results indicate that both the SVE and groundwater treatment systems are functioning as designed, and that the groundwater system effluent is meeting the levels established in the NPDES permit. The monitoring wells located on the Site are sampled regularly, and will continue to be until all the remedial goals for all contaminants are achieved. Several contaminants are still present above their ROD goals. However, the concentrations of VOCs in the groundwater at the Site have continued to decline.

Since start-up of the groundwater recovery system, over 100 million gallons of VOC-affected groundwater have been recovered and treated. Over 243 pounds of VOCs have been removed from groundwater (see Attachment D). More than 2,234 pounds of VOCs have been recovered from the vadose zone using the SVE treatment system, with almost 70% derived from Area 3 (see Attachment E). Operation and maintenance cost information is not available. In accordance with EPA Superfund requirements, such information will be included in the Final Remedial Action Report.

Section 5. Progress Since the Last Five-Year Review

The first Five-Year Review was completed July 21, 1999. The first Review determined that "the overall level of groundwater contamination has been decreasing since the signing of the ROD," and thus "it is believed that the Remedial Action at this Site is protective of human health and the environment." The single follow-up recommendation from the first Five-Year Review was that additional sampling be performed in the three defined source areas, previously designated as "Areas 1, 2, and 3" in the RI/FS and RD.

In 1999, the responsible party, with EPA oversight, collected soil samples and groundwater samples from seven soil borings located in the three areas of concern. These Performance Standards Verification Plan (PSVP) borings showed the soil cleanup goals in Area 1 and Area 2 had been achieved. Also, in August 1999, a limited soil investigation was performed in Area 2 to evaluate the nature of a sludge-like layer of material found at soil boring PSVB-2-1. This

investigation determined the sludge-like material was not a concern. Consequently, SVE operations were terminated in Areas 1 and 2 in June 2000.

In October 2000, an additional SVE well and three DP wells were installed in area 3 to further enhance removal of VOCs from the subsurface soils. The installation of these wells was part of a Technical Maximization Measures (TMM) program to improve the effectiveness of the extraction systems. Other TMM include alternate pumping and pulse purging.

A 120-foot bedrock well (MW-3D) was installed in 2001 to further characterize the VOC concentration remaining in the groundwater in this area. In December 2002, 31 ppb of tetrachloroethene and 28 ppb trichloroethene were found in this well.

Recent evaluation of the Site remediation progress suggests that the existing remediation systems may be approaching asymptotic conditions in their ability to remove target VOCs from the subsurface. Consequently, as a system optimization initiative, a work plan and design report was submitted by the PRPs in April 2004 to implement a supplemental remedial action, enhanced reductive dechlorination, at the Site. Reductive dechlorination is expected to enhance treatment performance and accelerate remedy completion. This work plan is currently under review by EPA and SCDHEC.

Section 6. Five-Year Review Process

A. Administrative Components

SCDHEC initiated the second Five-Year Review in May 2004. The components of the review include community involvement, data and document review, site inspection, and interviews, as summarized below.

B. Community Involvement

Activities involving the community were initiated with a notice that was sent to the local newspaper stating that a Five-Year Review was to be conducted. This notice was posted in the Gaffney Ledger on June 30, 2004. A copy of the public notice is provided in Attachment F of this report.

To date there have been no comments received from the public. RMT, the consultants for the PRPs, submitted a response to the various issues noted in the site inspection (described below, Section 6D). RMT indicated that many of the deficiencies outlined in this report would be corrected. The entire text of the response is in Attachment F.

Within thirty (30) calendar days of the report finalization, a notice will be published in the Gaffney Ledger announcing that the Five-Year Review report for the Medley Farm Drum Dump Superfund site is complete, and that the results of the review and the report are available to the public at the Cherokee County Public Library, 300 East Rutledge Avenue, Gaffney, SC 29340, [phone (864) 487-2711]. This report will also be placed in the Administrative file at both the EPA Region 4 and SCDHEC offices.

C. Document Review/Data Review

This Five-Year Review consisted of a review of relevant documents including O&M records and monitoring data. Attachment G provides a list of these documents.

The monitoring wells located on the Site are sampled regularly, and will continue to be until all the remedial goals for all contaminants are achieved. Several contaminants are still present above their ROD goals. However, the concentrations of VOCs in the groundwater at the Site have continued to decline.

As noted earlier, over 100 million gallons of VOC-affected groundwater has been recovered and treated since start-up of the groundwater recovery system. Over 243 pounds of VOCs have been removed from the aquifer, and over 2,234 pounds of VOCs have been recovered from the vadose zone using the SVE treatment system. Soil cleanup goals in Areas 1 and 2 have been achieved. Soil remedial work is ongoing in Area 3.

D. Site Inspection

A site inspection was conducted on May 27, 2004. The purpose of the inspection was to assess the protectiveness of the remedy, including the security of the wells. Representatives from SCDHEC Bureau of Land and Waste Management participated in this site inspection. The inspection included walking the Site and checking the groundwater monitoring and extraction wells. The following five (5) deficiencies were noted:

- Drums located by the storage shed, northwest of the treatment system, were not labeled.
- Wells VM-101, VE-101, VE-304, and MW-3D were not labeled.
- At the treatment plant, the vault for the A-System was not covered. The B-System valve handle was cracked and the vault was not covered.
- The recent timber operation conducted at the Site appears to have affected the wetlands north of SW-202. This area was logged and tire tread marks were visible through the creek bed.
- Due to the inaccurate scale of a recently-prepared reference map (Plate 1, "Injection and Groundwater Monitoring Well Distribution," in the "Workplan and Design

Report for Reductive Dechlorination," currently in review), several wells could not be located. They include BW-201, SW-201, SW-103, BW-111, BW-112, and VM-302.

The "Site Inspection" checklist form and site photographs are provided in Attachments I and J.

E. Interviews

Interviews were conducted with various parties connected to the site. Mr. Ralph Howard, P.G. (RPM, EPA Region 4) was interviewed on June 28, 2004. He said he has been kept informed on all activities and progress, and his general impression is that the project has gone very well. All work to date by the PRPs has been performed without much conflict and in full compliance with the legal orders arranged for the RI/FS and the RD/RA. An interview with the SCDHEC project Hydrogeologist, Ms. Minda Johnson-Schmiedel, was conducted during the site inspection on May 27, 2004. Monitoring well locations, current uses of the Site, groundwater and soil remediation activities, and the timbering of the Site were discussed. The interview documentation form is in Attachment K.

Section 7. Technical Assessment

A. Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, and the results of the site inspection indicate that the remedy is functioning as intended by the ROD.

The groundwater extraction system and the soil vapor extraction system continue to operate as designed. EPA and SCDHEC review of quarterly and annual groundwater monitoring reports indicates that the groundwater plume is contained and contaminant levels are steadily decreasing. The soil removal action in 1983, and continuous operation of the SVE system since 1995, have eliminated exposure via surface soil contact. Compliance with NPDES permit requirements for the extraction system effluent has remained excellent throughout the RA.

As noted earlier, recent evaluation of the Site remediation progress suggests that the site soil and groundwater remediation systems may be approaching asymptotic conditions in their ability to remove target VOCs from the subsurface. A systems optimization initiative is underway to develop and use enhanced reductive dechlorination is expected to accelerate remedy completion. This work plan is currently under review by EPA and SCDHEC.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

A review of these remedy criteria was performed by a SCDHEC Risk Assessor in the Bureau of Land and Waste Management.

The review recommended that no changes to the reviewed soil remediation levels be made. It also concluded that the exposure pathways have not changed since the ROD was signed in 1991. EPA and SCDHEC have verified that there are no land use changes at the site.

Concerning groundwater, the Risk Assessor recommended that the cleanup levels for 1,1-dichloroethane, 2-butanone, acetone, and chloromethane be reevaluated to determine if changes to the groundwater cleanup goals needed to be made. The complete text of the risk assessor's evaluation can be found in Appendix G. Table 2 summarizes these recommendations.

Table 2 - Changes in Chemical-Specific Groundwater Standards

Contaminant	Standard		Citation
1,1-Dichloroethane	Previous	350 ppb	Site Risk Assessment, 1991
	New TBC	70 ppb	Iowa cleanup standard, 1999
2-Butanone (MEK)	Previous	2,000 ppb	Site Risk Assessment, 1991
	New TBC	1,900 ppb	EPA Region 9 PRG-tap water, 2002
Acetone	Previous	350 ppb	Site Risk Assessment, 1991
	New TBC	610 ppb	EPA Region 9 PRG-tap water, 2002
Chloromethane	Previous	63 ppb	Site Risk Assessment, 1991
	New TBC	3 ppb	Lifetime Health Advisory, 2002

"New TBC (To Be Considered)" are State or Federal criteria that have been established since ROD issuance which can be considered in determining the protectiveness of current remedial goals.

Groundwater data from 1995 to 2002 were reviewed. The chemicals 1,1-dichloroethane and 2-butanone were not detected above the concentrations of 70 ppb and 1900 ppb, respectively. Acetone has been detected six times above the EPA Region 9 PRG of 610 ppb. The detections were found in wells MLW-3-1 and SW-04. MLW-3-1 and SW-04 are located on opposite sides of the Site. It is important to note that acetone is a common laboratory contaminant. Chloromethane has been detected once above the Lifetime Health Advisory (LHA) concentration of 3 ppb (the EPA Region 9 tap water PRG is 1.5 ppb).

At present, the data do not indicate that the protectiveness of the remedy is affected. The chemicals listed above will continue to be monitored. The cleanup standards could be revised in the future, if necessary. The detection limit for chloromethane should remain below 1.0 ppb.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that calls into question the protectiveness of the remedy.

Technical Assessment Summary:

According to the data reviewed, the site inspection, and the interviews, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Section 8. Issues

The main issue requiring follow-up is the implementation of the supplemental remedial action, which is a systems optimization initiative intended to develop and use enhanced reductive dechlorination to accelerate remedy completion. This issue is carried forward into Section 9 below.

As mentioned above in Section 6D, several deficiencies were noted in the Site Inspection. These included drums located northwest of the treatment system that were not labeled; several wells that were not labeled; a cracked valve handle at the treatment plant; and, also at the treatment plant, vaults which were not covered. (However, according to RMT, these vaults are left uncovered for health and safety reasons, and can be maintained satisfactorily, and this point will not be carried forward as an open issue.) A reference map had an inaccurate scale so that wells could not be found, and concerns were noted about the effects of logging in, and near, an onsite creekbed. These items will be carried forward into Section 9 below, as follow-up items. However, only the valve handle replacement would affect remedy protectiveness.

As noted in Section 7B, four site groundwater contaminants have had new cleanup criteria promulgated since the 1991 ROD. Current data do not indicate that changing the site cleanup goals is warranted. This point will be considered in future Five-Year Review reports, but it does not necessarily require that a specific follow-up action be assigned at this time. Likewise, EPA and SCDHEC will require continued use of a laboratory detection limit for chloromethane that is below 1.0 ppb, but this item will not require a specific follow-up action be assigned.

Section 9. Recommendations and Follow-up Actions

Table 3 below highlights the recommended follow-up actions, assigned responsibilities, and milestone dates. The most significant action, which will be the focus of cleanup activities in the near future, is the implementation of an enhanced reductive dechlorination process for groundwater. Frequent meetings and communication between the PRP consultant's technical team, EPA staff, and SCDHEC staff is envisioned in the current work plans.

The other actions, other than replacing the valve handle, do not affect the future protectiveness of the remedy, but they will be corrected, investigated, and/or monitored. RMT, the consultants for the PRPs, has already submitted a response (Attachment F) to various issues noted in the site inspection (Section 6D) and indicated that the deficiencies would be rectified quickly.

Table 3: Recommendations and Follow-up Actions

Issue	Recommend-ations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Initiate supplement-al R.A. to improve and accelerate progress toward Site groundwater cleanup goals	Obtain EPA/ State approval for work plans and begin implementation	PRP	EPA	Dec. 31, 2004	N	Y
B-System valve handle is cracked	Fix or replace the valve handle	PRP	EPA	Dec. 31, 2004	N	Y
ITEMS BELOW REQUIRE FOLLOW-UP BUT DO NOT AFFECT PROTECTIVENESS.						
Unlabeled drums located northwest of the treatment system	Label drums or dispose of them properly	PRP	EPA	Dec. 31, 2004	N	N
Wells VM-101, VE-101, VE-304, and MW-3D were not labeled	Label the wells	PRP	EPA	Dec. 31, 2004	N	N
The wetlands north of SW-202 were logged and tire tread marks were visible through the creek bed	Investigate the current damage and establish safeguards to avoid future damage	PRP	EPA	Dec. 31, 2004	N	N
Wells BW-201, SW-201, SW-103, BW-111, BW-112, and VM-302 could not be located	Correct the inaccurate scale of the reference map	PRP	EPA	Dec. 31, 2004	N	N

Section 10. Protectiveness Statement

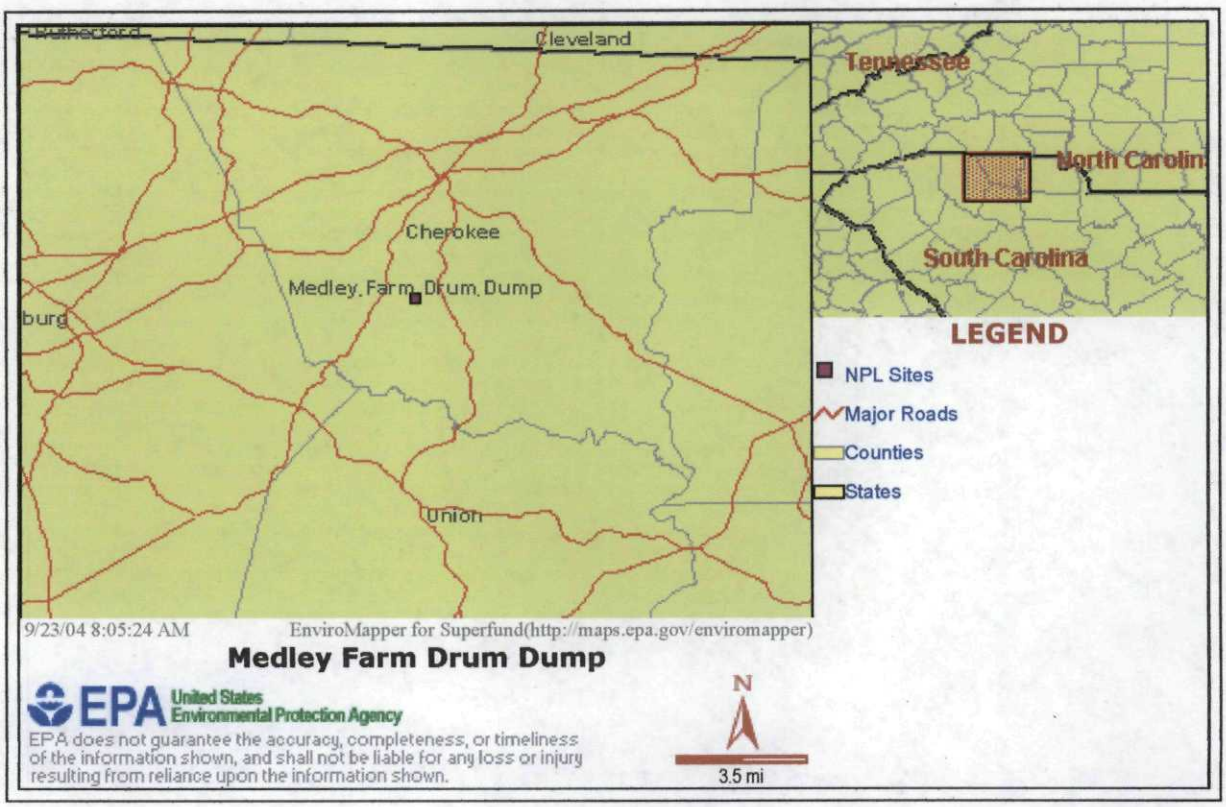
The long-term remedy at the Medley Farm Site, as prescribed in the ROD for soils and groundwater, is still in progress. The extent and degree of groundwater and soil contamination has been decreasing since the remedial action began. The remedy at the Medley Farm Site is expected to be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

Section 11. Next Review

Since ongoing remedial action has not achieved the cleanup standards set forth in the ROD for all the soil and groundwater, EPA guidance mandates that another Five-Year Review will be conducted to evaluate the Site's status. Therefore, it will be necessary to re-evaluate the effectiveness of the remedy on or before five years from the date of signature of this Five Year Review Report.

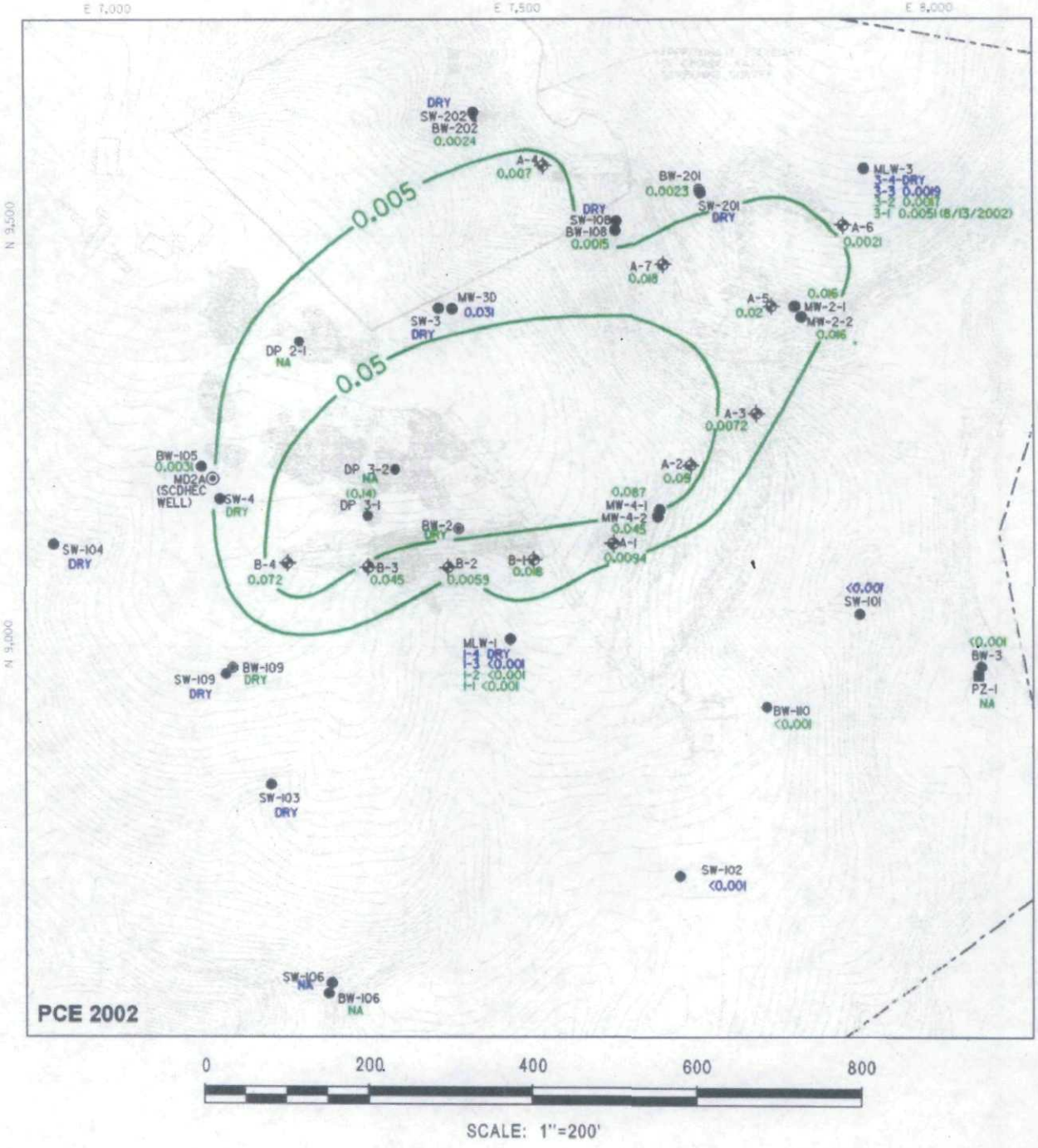
ATTACHMENT A

Site Location Map

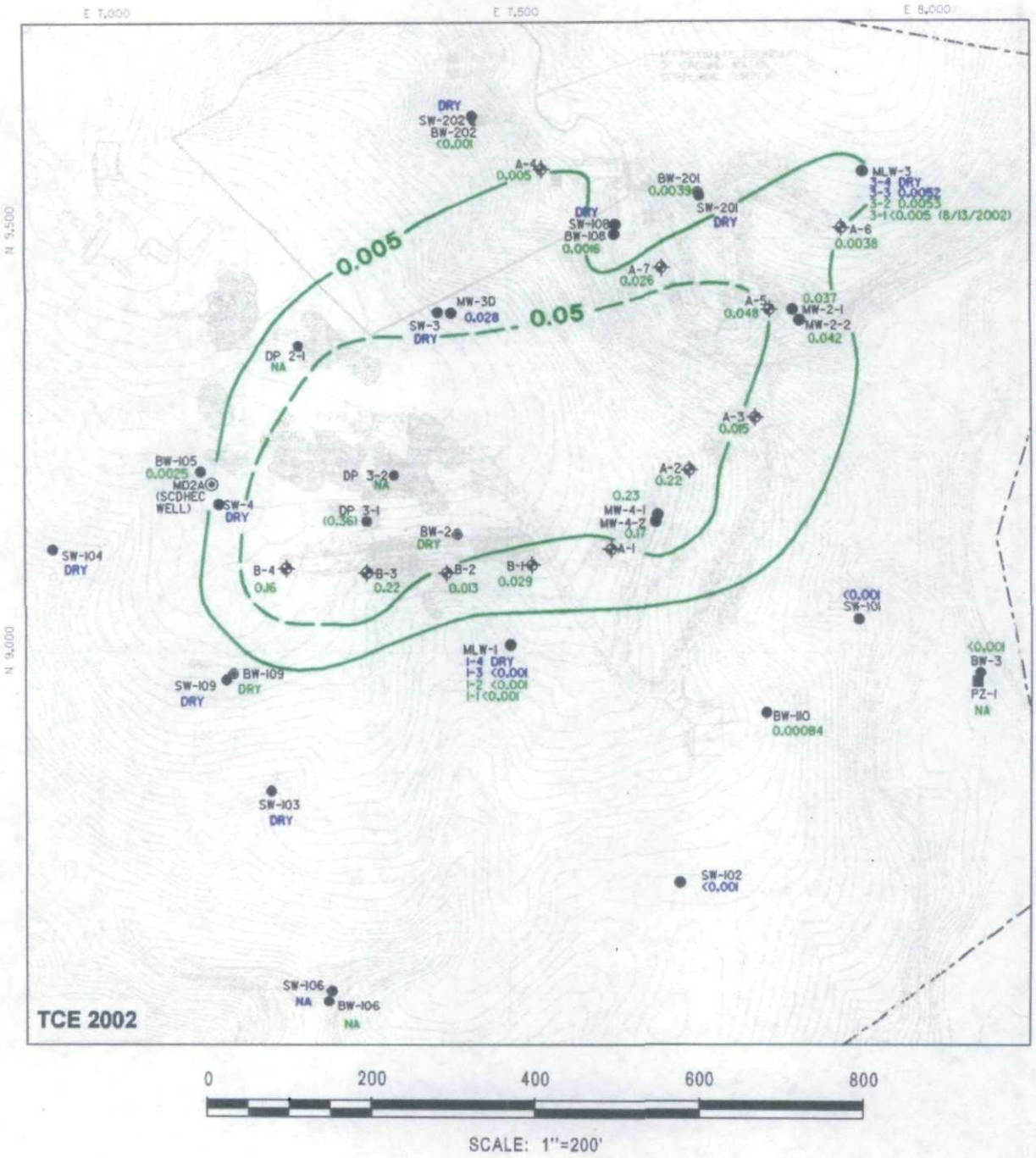

Cleveland
Cherokee
Medley Farm Drum Dump
Union
burg
Tennessee
North Carolina
South Carolina
LEGEND
NPL Sites
Major Roads
Counties
States
9/23/04 8:05:24 AM
EnviroMapper for Superfund(http://maps.epa.gov/enviromapper)
Medley Farm Drum Dump
EPA United States Environmental Protection Agency
EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.
N
3.5 mi

ATTACHMENT B

Groundwater Contaminant Distribution (PCE, TCE)



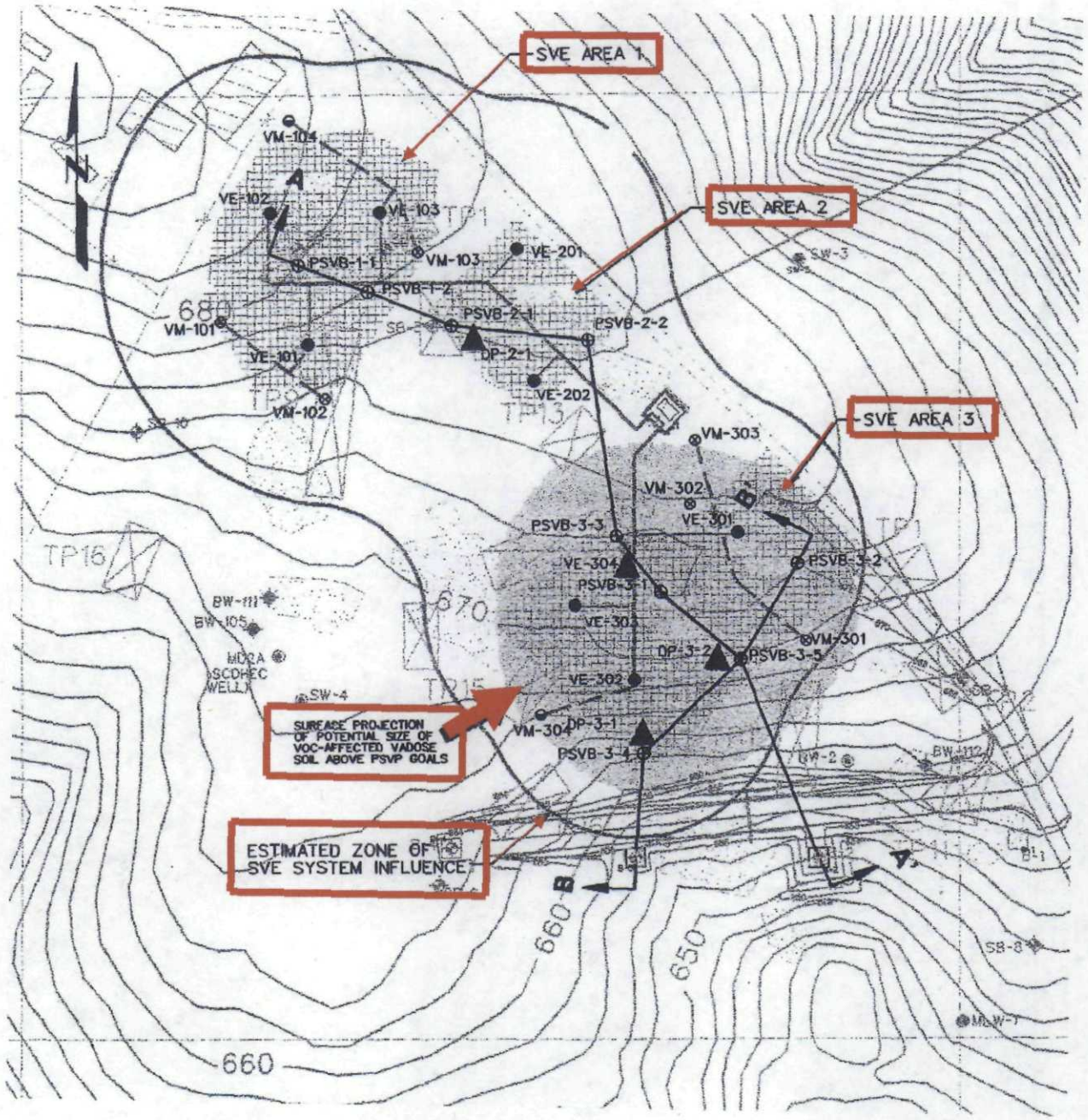
Distribution of PCE. Isocontours in mg/l. Vertical (top of page) is due North. (2002 Data)



Distribution of TCE. Isocontours in mg/l. Vertical (top of page) is due North. (2002 Data)

ATTACHMENT C

Soil Treatment Areas



▲ DP/SVE wells installed in October 2000

● Vapor Extraction well

⊗, ◒ Vapor Monitoring well

⊕ PSVB (soil) boring

A A' Cross Section locator

ATTACHMENT D

Historical VOC Mass Removal - Groundwater

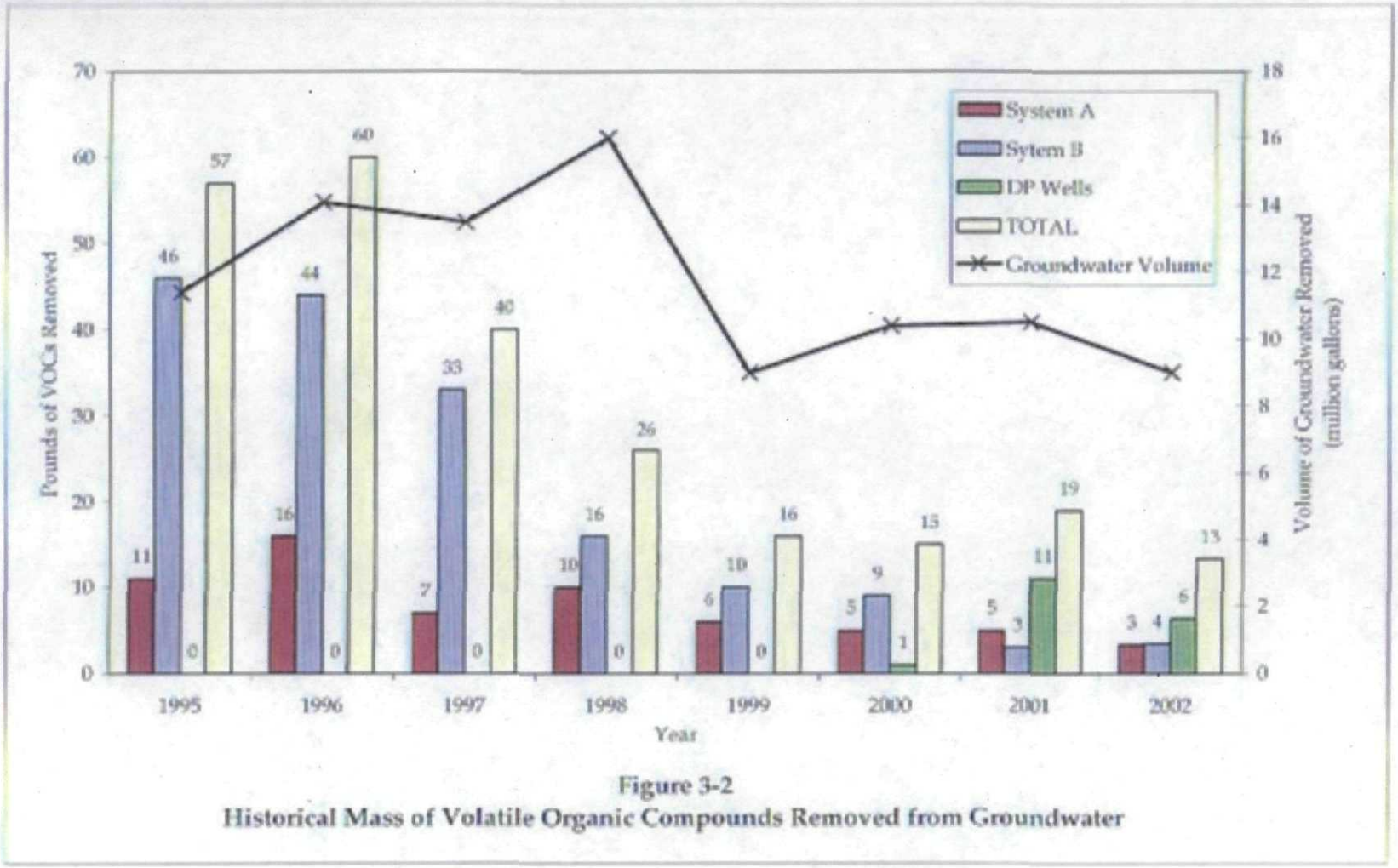


Figure 3-2
Historical Mass of Volatile Organic Compounds Removed from Groundwater

ATTACHMENT E

Historical VOC Mass Removal – Soil Vapor Extraction (Area 3)

Table 3-1
Cumulative Estimate of Volatile Organic Compounds Removed from Area 3 via Soil Vapor through 2002

WELL NUMBER	TCE (lbs)	1,1,1-TCA (lbs)	PCE (lbs)	1,2-DCA (lbs)	1,1-DCA (lbs)	1,2-DCE (lbs)	TOTAL (lbs)
DP-3-1	1.27	0	4.10	4.10	0	.25	9.72
DP-3-2	0.980	0	0.36	1.74	0	0	3.06
VE-301	103.42	2.17	63.04	110.57	2.48	1.77	283.45
VE-302	72.53	0.77	7.46	100.22	0.79	1.71	183.49
VE-303	139.53	0.82	30.28	211.84	0.59	0.97	384.03
VE-304	9.01	0	4.82	15.63	0	0.00	29.46
VM-301S	6.94	0	5.53	5.72	0	.33	18.19
VM-301D	73.47	0	25.61	74.05	0	4.50	177.62
VM-302S	0	0	2.42	0	0	0	2.42
VM-302D	13.1	0	63.27	6.34	0	0.70	83.41
VM-303S	0	0	2.78	0	0	0	2.78
VM-303D	3.22	0	63	1.94	0	0	68.16
VM-304S	62.89	0	2.81	170.57	0	0	236.27
VM-304D	22.17	0	1.56	27.41	0	3.04	54.18
AREA 3	**508.53**	**3.76**	**277.04**	**730.13**	**3.86**	**10.23**	**1,534**

ATTACHMENT F

Community Involvement - Newspaper Notice,

Comments (PRP Contractor)

The Gaffney Ledger

(864) 489-1131
FAX (864) 487-7667

1604 W. Floyd Baker Blvd. — P.O. Box 670 — Gaffney, S.C. 29342

STATE OF SOUTH CAROLINA

COUNTY OF CHEROKEE

Personally came before me, a Notary Public for State and County aforesaid, Carolyn C. Moss, Secretary/Receptionist for The Gaffney Ledger, Inc., a newspaper published at Gaffney, South Carolina, and on oath says that the above advertisement did appear in said newspaper, and that the clipping herewith attached and made a part of this affidavit is a true copy of said advertisement as it appeared in said newspaper on June 30, 2004

Carolyn C Moss

Carolyn C. Moss, Secretary/Receptionist, The Gaffney Ledger, Inc.

Sworn to before me this

30th day of June 2004

Sonya Poole

Notary Public for South Carolina

NOTICE

The U.S. Environmental Protection Agency (EPA), Region IV, and the South Carolina Department of Health and Environmental Control (DHEC) announce the start of a Five-Year Review for the Modine Parts Superfund Site in Gaffney, Cherokee County, South Carolina. Five-Year Reviews assess the protectiveness of cleanup actions taken at Superfund sites.

EPA issued a Record of Decision (ROD) in May 29 1991, which selected extraction and passive treatment of contaminated groundwater using air stripping. Treated water was to be discharged to Jones Creek under a National Pollution Discharge Elimination System (NPDES) permit. Continuous analytical monitoring of groundwater and surface water would be performed. Soil Vapor Extraction (SVE), a technique that applies a vacuum on air extraction wells to remove contaminants, was selected to remove pollutants from the soil. The treatment systems described in the ROD were constructed onsite in 1994-1995, and have operated continuously at the Site since 1995.

SCDHEC and EPA anticipate that this Five-Year review will be completed by July 2004, and the report will be available for public review or copying at the Cherokee County Public Library, 300 East Rutledge Avenue, Gaffney, SC 29340, (phone (864) 487-2711).

For further information please contact:
Keisha D. Long
Federal and Drycleaning Remediation Section
Bureau of Land and Waste Management/SCDHEC
8901 Farrow Road
Columbia SC, 29203
Ph: (803) 896-4073
Fax: (803) 896-4292
E-Mail: longkd@dhec.sc.gov
OR
Ralph O. Howard, P.G.
Remedial Project Manager
US Environmental Protection Agency, Region IV
Waste Management Division
61 Forsyth Street, 11th Floor
Atlanta, GA 30303
Ph: (404) 562-8829
E-Mail: howard.ralph@epamail.epa.gov
Published: June 30, 2004

NOTICE

The U.S. Environmental Protection Agency (EPA) Region 4 and the South Carolina Department of Health and Environmental Control (DHEC) announce the start of a second Five-Year Review for the Medley Farm Superfund Site in Gaffney, Cherokee County, South Carolina. Five Year Reviews evaluate the protectiveness of cleanup actions taken at Superfund sites.

EPA issued a Record of Decision (ROD) in May 29,1991, which selected extraction and on-site treatment of contaminated groundwater using air stripping. Treated water was to be discharged to Jones Creek under a National Pollution Discharge Elimination System (NPDES) permit. Continuous analytical monitoring of groundwater and surface water would be performed. Soil Vapor Extraction (SVE), a technique that applies a vacuum on air extraction wells to remove contaminants, was selected to remove pollutants from the soil. The treatment systems described in the ROD were constructed onsite in 1994-1995, and have operated continuously at the Site since 1995.

SCDHEC and EPA anticipate that this Five-Year review will be completed by July 2004, and the report will be available for public review or copying at the Cherokee County Public Library, 300 East Rutledge Avenue, Gaffney, SC 29340, [phone (864) 487-2711].

For further information please contact:

Keisha D. Long
Federal and Drycleaning Remediation Section
Bureau of Land and Waste Management-SCDHEC
8901 Farrow Road
Columbia SC, 29203
Ph: (803) 896-4073
Fax: (803) 896-4292
E-Mail: longkd@dhec.sc.gov
OR
Ralph 0. Howard, P.O.
Remedial Project Manager
US Environmental Protection Agency, Region IV
Waste Management Division
61 Forsyth Street, 11th Floor
Atlanta, GA 30303
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Published: June 30, 2004

RMT
Integrated
Environmental
Solutions

Patewood Plaza One, Suite 100
30 Patewood Drive 29615-3535
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Greenville, SC
Telephone: 864-281-0300
Fax: 864-281-0288

www.rmtinc.com

July 28, 2004

Ms. Keisha Long
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Subject: United States Environmental Protection Agency (USEPA) Five-Year Report

Dear Ms. Long:

I have reviewed the draft five-year report prepared by South Carolina Department of Health and Environmental Control (SC DHEC) and assessed several items identified by SC DHEC personnel during their recent site inspection. The following comments have been prepared by RMT, Inc.'s (RMT's) field staff in response to the questions raised by the regulators. Department comments are provided in bold, followed by RMT's responses:

1. **How many drums are located near the storage shed and what do they contain?**

   During the early remedial design/remedial action (RD/RA), USEPA requirements called for purge water derived from on-site ground water sampling activities to be collected in 55-gallon drums located adjacent to each monitoring well. Standard operating procedures no longer require these measures and approximately 20 empty drums are now located near the storage shed. Since we no longer envision any future use for these drums, unless there is some objection, RMT will have them removed from the site and properly disposed of.

2. **Wells VM-101, VE-101, VE-304, and MW-3d were not labeled.**

   RMT acknowledges that the labeling associated with these and other wells may have diminished with time and exposure to the elements. The field team will examine all such monitoring points and re-label and/or attach engraved identification plates to all requiring attention.

3. **At the treatment plant, the A-system vault was uncovered...Why?**

   The referenced vaults contain return isolation valves for both the A-system and the B-system. One of the ongoing technical maximization measures employed at the site involves periodic isolation of the A-system and the B-system (alternate/pulse pumping). System maintenance requirements also call for periodic isolation of these two treatment systems. We have also experienced proliferation of black widow spiders in these valve pits when the covers have been left on. Since the covers are very heavy and leaving the lids open has apparently discouraged accumulation of black widow spiders, RMT has elected to leave the covers open.

4. The B-system valve handle was cracked and the vault uncovered...Why?

The treatment operator noticed the crack in the valve handle several months ago. Since the crack has not appreciably affected either maintenance or treatment activities, it remains on a punch-list of operations and maintenance (O&M) activities that will be addressed in the coming months. See item #3, above, for discussion regarding vault cover.

If there are any further questions or responses required, please feel free to contact me at your earliest convenience. I can be reached at (864) 234-9363.

Sincerely,

RMT, Inc.

Brian T. Grothaus for Steve Webb

Steve W. Webb, Ph.D., P.E.
Senior Project Manager

Attachments:

cc: Ralph Howard, USEPA
Medley Farm Steering Committee
Brian Grothaus, RMT
Neal Dunlap, RMT
Larry Jenkins, RMT
Jeff Friend, RMT
Central Files

ATTACHMENT G

List of Documents Reviewed

List of Documents Reviewed

1. "2002 Remedial Action, Annual Report, Medley Farm NPL Site, Gaffney, South Carolina," RMT, March 2003.

2. "Comprehensive Five-Year Review Guidance –Appendix G, EPA 540-R-01-007, OSWER No. 9355.7-03B-P," USEPA, June 2001. http://www.epa.gov/superfund/resources/5year/index.htm

3. "EPA Superfund Record of Decision: Medley Farm Drum Dump, EPA ID: SCD980558142, OU 01, Gaffney, SC, 05/29/1991." http://www.epa.gov/superfund/sites/rods/fulltext/r0491081.pdf

4. "Five Year Review Report (Type 1), Medley Farms Site, Gaffney, South Carolina," USEPA, July 1999. http://www.epa.gov/region4/waste/npl/nplsc/medley5yr.pdf

5. Iowa Department of Natural Resources, 1999, Table 1 – Statewide Standards for Groundwater, Iowa Land Recycling Program, 11 pp.

6. "Medley Farm Site, Remedial Action, Five Year Report, February 2000," RMT, February 2000.

7. "Medley Farm Site, Remedial Design and Remedial Action, Performance Standards Verification Plan," RMT, August 1993.

8. Minnesota Department of Health, 2003, Rule Revision - Health Risk Limits for Groundwater Rule, 3 pp.

9. Minnesota Department of Health, 2003, Rule Revision - Health Risk Limits for Groundwater Rule, 3 pp.

10. Minnesota Department of Health, 1996, Health Risk Limits for Groundwater and Table of Health Risk Limits for Groundwater and Toxicologic Endpoints, 8 pp.

11. "Technical and Regulatory Requirements for Enhanced In Situ Bioremediation of Chlorinated Solvents in Groundwater," ITRC, December 1998. http://www.itrcweb.org/isb-6.pdf

12. "Technical Memorandum: Medley Farm Site, Performance Standards Verification Sampling, Results of the August 1999 Soil boring and Groundwater Sampling Program," RMT, December 3, 1999.

13. USEPA, IRIS, 2004.

14. USEPA, List of Drinking Water Contaminants and MCLs, 10 pp, 2003.

15. USEPA, 2002 Edition of the Drinking Water Standards and Health Advisories, EPA 822-R-02-038, Office of Water, USEPA, Washington, DC, 12 pp, Summer 2002.

16. USEPA, Comprehensive Five-Year Review Guidance –Appendix G, EPA 540-R-01-007, OSWER No. 9355.7-03B-P, June 2001.

17. "Workplan and Design Report for Reductive Dechlorination, Medley Farm NPL Site, Gaffney, South Carolina," RMT, April 2004.

ATTACHMENT H

Applicable or Relevant & Appropriate Requirements Review

D H E C

PROMOTE PROTECT PROSPER

MEMORANDUM

To: Keisha Long, Project Manager
Federal and Dry Cleaning Remediation Section
Division of Site Assessment and Remediation
Bureau of Land and Waste Management

From: Gregory C. Simones, P.G., Risk Assessor
Federal Facility Agreement Section
Division of Site Assessment and Remediation
Bureau of Land and Waste Management

Date: June 29, 2004

Re: Medley Farm Site
Gaffney, Cherokee County, South Carolina
Review of Cleanup Levels

The above referenced document has been reviewed as it relates to Risk Assessment Guidance for Superfund (RAGS), EPA Region IV Supplemental Guidance to RAGS, and the EPA Comprehensive Five-Year Review Guidance (Appendix G).

The following comments were generated from the review of this document. If you should have any questions, please contact me at (803) 896-4081.

Per your request (electronic, 06/18/04), I have reviewed the Soil Cleanup Goals for all eleven (17) chemicals listed in the provided table from the ROD (Table 11, Page 53) against current resources readily available through the Internet. The question, "Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?", from the five-year review guidance is used for this portion of the review.

Recommendations Regarding Remedial Levels for Chemicals in Site Soil

1. 1,1,2-Trichloroethane – Yes, still valid; This is one of five chemicals that are also found in groundwater at this site. The cleanup goal of 160 ppb was derived from a leachability model that bases its derivation on a groundwater MCL that is unchanged from the ROD.

2. 1,1,2,2-Tetrachloroethane – Not applicable; No cleanup levels were set for this chemical in soil.

3. 1,2-Dichloroethene (total) – Yes, still valid; This is one of five chemicals that are also found in groundwater at this site. The cleanup goal of 2,100 ppb was derived from a leachability model that bases its derivation on groundwater MCLs that are unchanged from the ROD.

4. 1,2-Dichloropropane – Not applicable; No cleanup levels were set for this chemical in soil.

5. Ethylbenzene – Not applicable; No cleanup levels were set for this chemical in soil.

6. Methylene Chloride - Yes, still valid; This is one of five chemicals that are also found in groundwater at this site. The cleanup goal of 40 ppb was derived from a leachability model that bases its derivation on a groundwater MCL that is unchanged from the ROD.

7. Styrene - Not applicable; No cleanup levels were set for this chemical in soil.

8. Tetrachloroethene (PCE) – Yes, still valid; This is one of five chemicals that are also found in groundwater at this site. The cleanup goal of 1,600 ppb was derived from a leachability model that bases its derivation on a groundwater MCL that is unchanged from the ROD.

9. Trichloroethene (TCE) – Yes, still valid; This is one of five chemicals that are also found in groundwater at this site. The cleanup goal of 500 ppb was derived from a leachability model that bases its derivation on a groundwater MCL that is unchanged from the ROD.

10. Vinyl Chloride – Not applicable; No cleanup levels were set for this chemical in soil.

11. 1,2,4-Trichlorobenzene – Not applicable; No cleanup levels were set for this chemical in soil.

12. Butylbenzylphthalate – Not applicable; No cleanup levels were set for this chemical in soil.

13. Di-n-butylphthalate – Not applicable; No cleanup levels were set for this chemical in soil.

14. Di-n-octylphthalate – Not applicable; No cleanup levels were set for this chemical in soil.

15. Bis(2-Ethylhexyl)phthalate – Not applicable; No cleanup levels were set for this chemical in soil.

16. Toxaphene – Not applicable; No cleanup levels were set for this chemical in soil.

17. PCB-1254 – Not applicable; No cleanup levels were set for this chemical in soil.

Therefore, it is recommended that no changes to the reviewed remediation levels be made.

Per your request (verbal, 06/18/04), I have reviewed the Groundwater Cleanup Goals for all fourteen (14) chemicals listed in the provided table from the ROD (Table 11, Page 53) against current resources readily available through the Internet. The question, "Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?" from the five-year review guidance is used for this portion of the review.

Recommendations Regarding Remedial Levels for Chemicals in Site Groundwater

1) 1,1-Dichloroethene (1,1-DCE) – Yes, still valid; The cleanup goal was based on the MCL of 7 ppb, however, there is a reference a lower value of 6 ppb which is based on a LHA and 10^{-4} cancer risk. This lower value does not represent a significant change in risk.

2) 1,1-Dichloroethane – No, there is uncertainty associated with this standard; The original clean up goal of 350 ppb was derived from an EPA reference dose (RfD) with a 10-fold safety factor. There is not currently an RfD available on EPA's Integrated Risk Information System (IRIS). This would make a revised clean up goal calculation impossible. The states of Iowa and Minnesota use a standard of 70 ppb. In the absence of other criteria, it can be assumed to behave like chemicals of similar structure. Cis-1,2-DCE is a chemical with similar structure that has a cleanup goal of 70 ppb.

3) 1,1,1-Trichloroethane – Yes, still valid; The cleanup goal of 200 ppb was based on a MCL that is still current.

4) 1,1,2-Trichloroethane – Yes, still valid; The cleanup goal of 5 ppb was based on a proposed MCL that is now a final MCL.

5) 1,2-Dichloroethane – Yes, still valid; The cleanup goal of 5 ppb was based on a MCL that is still current.

6) 1,2-Dichloroethene (total): [cis-1,2-Dichloroethene (cis-1,2-DCE) – Yes, still valid; The cleanup goal of 70 ppb was based on a proposed MCL that is now a final MCL.] [trans-1,2-Dichloroethene (trans-1,2-DCE) – Yes, still valid; The cleanup goal of 100 ppb was based on a proposed MCL that is now a final MCL.]

7) 2-Butanone (MEK) – No, there is uncertainty associated with this standard; The original clean up goal of 2,000 ppb was derived from an EPA reference dose (RfD). There is currently an RfD available on EPA's Integrated Risk Information System (IRIS). It does not appear to have changed from the value used to make the original calculation. By comparison, the tap water PRG from the EPA Region 9 table is 1,900 ppb.

8) Acetone – No, there is uncertainty associated with this standard; The original clean up goal of 350 ppb was derived from an EPA reference dose (RfD). There is currently an RfD available on EPA's Integrated Risk Information System (IRIS). It does not appear to have changed from the value used to make the original calculation. By comparison, the tap water PRG from the EPA Region 9 table is 610 ppb. Also, a concentration of 700 ppb is based on a lifetime health advisory (LHA).

9) Benzene – Yes, still valid; The cleanup goal of 5 ppb was based on a MCL that is still current.

10) Chloroform – Yes, still valid; The cleanup goal of 100 ppb was based on a MCL that is still current.

11) Chloromethane – No, there is uncertainty associated with this standard; The original clean up goal of 63 ppb was chosen to be representative of a one in one hundred thousand excess cancer risk (10^{-5}). Also, a concentration of 3 ppb is based on a lifetime health advisory (LHA).

12) Methylene Chloride - Yes, still valid; The cleanup goal of 5 ppb was based on a proposed MCL that is now a final MCL.

13) Tetrachloroethene (PCE) – Yes, still valid; The cleanup goal of 5 ppb was based on a MCL that is still current.

14) Trichloroethene (TCE) – Yes, still valid; The cleanup goal of 5 ppb was based on a MCL that is still current.

Therefore, it is recommended that 1,1-Dichloroethane, 2-Butanone, Acetone, and Chloromethane be reevaluated to determine if changes to the reviewed cleanup goals need to be made.

ATTACHMENT I

Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Medley Farm Dump Site	**Date of inspection: 05/27/2004**
Location and Region: Gaffney, SC; Region 4	**EPA ID:** SCD980558142
Agency, office, or company leading the five-year review: SCDHEC	**Weather/temperature: 90+°; clear**

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☐ Institutional controls
- ■ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ■ Other__Excavation/drum removal_____
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Ralph Howard (Name) RPM (Title) __/2004 (Date)
   Interviewed ☐ at site ☐ at office ■☐by phone Phone no. ☐E-mail
   Problems, suggestions; ☐ Report attached _____

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency SCDHEC
Contact Keisha D. Long Environmental Engr Assoc 803-896-4073
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency SCDHEC
Contact Minda Johnson-Schmiedel Hydrogeologist 05/27/2004 803-896-4030
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

Agency _____
Contact _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☐N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐N/A

Remarks _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐N/A
☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐N/A
Remarks _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☐N/A
Remarks _____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☐N/A
	☐ Effluent discharge	☐Readily available	■☐Up to date	☐N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☐N/A
	☐ Other permits_____	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			
7.	**Groundwater Monitoring Records**	☐Readily available	☐Up to date	☐N/A
	Remarks_____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☐N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐N/A
	Remarks_____			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
■☐PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost
From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☐Applicable ■☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐Gates secured ■☐N/A
Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ■☐N/A
Remarks___No Trespassing sign_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ■ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ■ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) residents on-site

Frequency daily

Responsible party/agency Medley Farm Steering Committee

Contact Amy Magee (Name) Attorney (Title) _____ (Date) 404-572-4600 (Phone no.)

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ■ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☐ No vandalism evident

Remarks

2. **Land use changes on site**

■ Remarks Logging activities

3. **Land use changes off site** ☐ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks

B. Other Site Conditions

Remarks Site is generally in good condition. However, various drums located northwest of the treatment system and wells VM-101, VE-101, VE-304, and MW-3D were not labeled. At the treatment plant, the B-System valve handle was cracked. The wetlands north of SW-202 were logged and tire tread marks were visible through the creek bed.

VII. LANDFILL COVERS ☐ Applicable ☐N/A

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☐N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐Applicable ☐N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐Applicable ■☐N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☐Good condition ☐All required wells properly operating ☐ Needs Maintenance ☐ N/A
   Remarks

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐Needs Maintenance
   Remarks vault for the A-System was not covered. The B-System valve handle was cracked and the vault was not covered.

3. **Spare Parts and Equipment**
   ☐Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐N/A

1. **Collection Structures, Pumps, and Electrical**
   ☐ Good condition ☐ Needs Maintenance
   Remarks

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☐ Good condition ☐ Needs Maintenance
   Remarks

3. **Spare Parts and Equipment**
   ■☐Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
   Remarks

C. Treatment System ☐Applicable ■☐N/A

1. **Treatment Train** (Check components that apply)
   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   ☐Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☐ Others_____
   ☐Good condition ☐ Needs Maintenance
   ☐ Sampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   ☐ Equipment properly identified
   ■☐Quantity of groundwater treated annually___± 10 million gallons___
   ☐ Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐N/A ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐Good condition ☐ Proper secondary containment ☐ Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☐Good condition ☐ Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   ☐ N/A ☐Good condition (esp. roof and doorways) ☐ Needs repair
   ☐ Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   ☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   ☐Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained ☐Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells**
   ☐ Properly secured/locked ☐Functioning☐Routinely sampled ☐Good condition
   ■☐All required wells located ☐ Needs Maintenance ☐N/A
   Remarks_____

X. OTHER REMEDIES

Soil Vapor Extraction

1. **Pumps, Wellhead Plumbing, and Electrical**■☐Good condition ☐All required wells properly operating ☐ Needs Maintenance ☐ N/A
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐Good condition ☐Needs Maintenance
3. **Spare Parts and Equipment** ☐Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
4. **Permits and Service Agreements** ☐ Air discharge permit ☐ Readily available ☐ Up to date ☐N/A
5. **Fencing damaged** ☐ Location shown on site map ☐Gates secured ■☐N/A

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Since start-up of the groundwater recovery system, nearly 100 million gallons of VOC-affected groundwater has been recovered and treated. This correlates to the removal of about 243 pounds of VOCs from the aquifer. Also, an estimated 2,234 pounds of VOCs have been recovered from the vadose zone using the SVE treatment system.

B. Adequacy of O&M

Treatment system laboratory results indicate that both the SVE and groundwater treatment systems are functioning as designed, and that the groundwater system effluent is meeting the levels established in the NPDES permit. The monitoring wells located on the Site are sampled regularly, and will continue to be until all the remedial goals for all contaminants are achieved. Several contaminants are still present above their ROD goals. However, the concentrations of VOCs in the groundwater at the Site have continued to decline.

C. Early Indicators of Potential Remedy Problems

Not Applicable

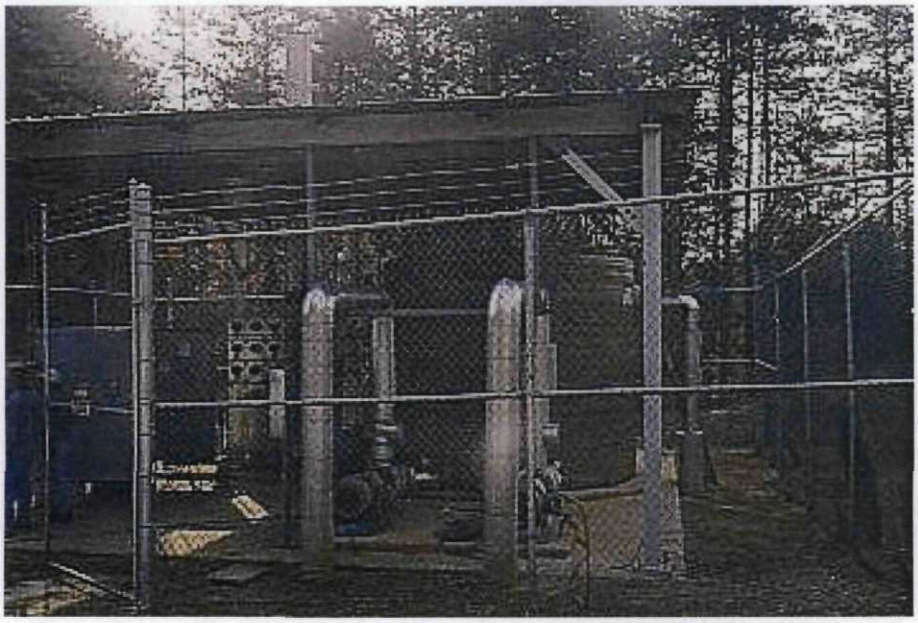
D. Opportunities for Optimization

Recent evaluation of the Site remediation progress suggests that the existing remediation systems may be approaching asymptotic conditions with regard to removal of target VOCs from the subsurface. Consequently, a work plan and design report was submitted in April 2004 to implement reductive dechlorination at the Site. Reductive dechlorination is a major biological process leading to the degradation of VOCs. Reductive dechlorination is expected to enhance treatment performance and accelerate remedy completion. This work plan is currently under review by EPA and SCDHEC.

ATTACHMENT J

Pictures

System that operates the dual phase wells



Groundwater Treatment System

Surface water discharge point for the treated groundwater (Jones Creek)

Limited excavation performed in Area 2. Monitoring well in the background.

ATTACHMENT K

Interview Documentation Form

INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review.

Name	Title/Position	Organization	Date
Ralph Howard, P.G.	Remedial Proj. Mgr	EPA-Region 4	06-28-2004
Minda Johnson-Schmiedel	Hydrogeologist	SCDHEC-BLWM	05-27-2004